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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Herbert Cermak

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For: COUNTER TRACK JOINT

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Signature

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination, please amend the application as follows:

In The Specification:

On page 5 of the English language translation of the specification, please insert the following heading between the title and the first paragraph of the specification to appear as follows:

COUNTER TRACK JOINT

Background Of The Invention

The invention relates to a constant velocity universal ball joint comprising of an outer joint part with outer ball tracks, an inner joint part with inner ball tracks, torque transmitting balls guided in pairs of tracks formed of one outer ball track and one inner ball track, an annular ball cage held between the outer joint part and the inner joint part and having circumferentially distributed cage windows each receiving one of the balls, the ball cage forms an inner face which is internally widened between two end apertures of the ball cage, the inner joint part comprises a greatest outer diameter which is greater than each of the inner diameters of the end apertures of the ball cage.

On page 6 of the English language translation of the specification, please insert the following heading between the first and second full paragraphs of the specification to appear as follows:

In the case of other joints it is possible for the inner joint part to be inserted into the ball cage through an end aperture of same, with intersecting axes, in such a way that one of the webs of the inner joint part engages one of the cage windows from the inside, and the radially opposite web of the inner joint part can subsequently be introduced through the same end aperture into the cage interior. After the inner joint part has reached its central position in the ball cage, the parts are rotated relative to one another in such a way that their axes coincide. This presupposes that the axial extension of at least one of the webs is shorter than the circumferential

extension of the cage windows. Said limitation of the web length restricts the ball guidance in the inner joint part.

Summary Of The Invention

With reference to constant velocity fixed ball joints wherein the length of the webs at the inner joint part exceeds the circumferential extension of the cage windows, i.e. in particular with joints with a large number of balls, it is the object of the invention to provide a design which avoids a loss of strength at the cage.

On page 8 of the English language translation of the specification, please amend the first full paragraph to appear as follows:

According to a special embodiment it is proposed that a longitudinally extending deepened groove has been worked into the track base of at least one inner ball track of the inner joint part. Furthermore, it is proposed that a centrally circumferentially extending deepened groove has been worked into the inner face of the ball cage. Furthermore, it is conceivable that, at least in a widened end portion of an inner ball track of the inner joint part, there has been worked in a notch which extends centrally relative to the longitudinal extension of the track. With the help of said measures the extent of ovalisation of the ball cage required for mounting the cage can be reduced in that there is achieved a deeper engagement between the inner edge of the end aperture of the cage and the inner ball track of the inner joint part.

On page 8 of the English language translation of the specification, please insert the following heading between the second and third full paragraphs of the specification to appear as follows:

> The solution in accordance with the invention is particularly suitable for joints with counter tracks wherein pairs of tracks of first outer ball tracks and of first inner ball tracks open in a first axial direction and wherein pairs of tracks of second outer ball track and of second inner ball tracks open in the second opposed axial direction. These joints will primarily be fixed joints wherein inner annular faces of the inner face of the ball cage are in a centring contact with outer faces of the inner joint part.
>
> **Brief Description Of The Drawings**
>
> Preferred embodiments of the invention are illustrated in the Figures and will be described below in greater detail with reference to the drawings wherein

On page 10 of the English language translation of the specification, please insert the following heading between the second and third paragraphs of the specification to appear as follows:

> Figure 7 For the most unfavourable assembly condition regarding the assembly of the ball cage and inner joint part:
>
> a) an axial view of the ovalised ball cage
>
> b) an axial view of the inner joint part and a longitudinal section through the ball cage in the characteristic assembly stage.

Detailed Description Of The Invention

Figure 1 is a longitudinal section through a constant velocity fixed ball joint of the type of a counter track joint; it shows an outer joint part 11, an inner joint part 12, balls 13 and a ball cage 17 in the form of different individual components. In the upper half of the Figure there is shown a pair of tracks consisting of a first outer ball track 15_1 in the outer joint part and a first inner ball track 16_1 in the inner joint part which forms an opening angle which opens towards the right. In the lower half of the Figure it is possible to see a pair of tracks consisting of a second outer ball track 15_2 in the outer joint part and a second inner ball track 16_2 in the inner joint part which forms an opening angle which opens towards the left. A joint with this kind of ball track formation is called a counter track joint. The two types of pairs of tracks – if viewed across the circumference – normally alternate with one another, i.e. as a rule, such joints are provided with an even number of balls. The balls 13 are received by cage windows 18 in the ball cage 17 which holds all the balls in such a way that their centres are located in a common plane. The inner ball tracks 16 comprise widening end portions 19, 20 which cannot have ball guiding functions. Further details will be explained with reference to the following Figures 2 and 3.